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COMMITTEE ON PAPERS AND PUBLICATIONS:

J. F. GEISLER,
A. C. HALE,
A. A. BRENEMAN, Editor.

ABSTRACTOR FOR AMERICAN PATENTS:

J. F. GEISLER.

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The Regular Monthly Meeting is held on the first Friday of every month, at 8 P. M.

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The Committee on Papers and Publications respectfully call attention to the resolutions of the Society, requiring that papers be submitted to the Committee before being read.

Authors will be furnished, gratis, with 20 reprints of each article published in the Journal, *if application for the same be made when the article is sent.*

Members are requested to give notice of any change of address, or failure in the delivery of the Journal. All communications relating to the Journal should be addressed to the Editor.

A. A. BRENEMAN, 97 Water St., New York.

REGULAR MEETING, November 6, 1891.

The regular meeting was called to order at 8:30 in the Law Lecture Room, University Building. Prof. A. A. Breneman in the chair.

The minutes of the October meeting were read, amended and accepted.

Prof. McMurtrie read the report of the Committee on Nominations giving the form of ballot decided upon and the names of nominees for the annual election.

After some discussion the report of the Committee was adopted.

The following nominations for membership were made :

Guy E. Couch, 44 W. Court St., Cincinnati, O.
J. C. Dittrich, 128 E. 54th St., N. Y.
Walter D. Field, 40 S. Portland Ave., Brooklyn, N. Y.
Wm. J. Karslake, 7 Kay St., Newport, R. I.
J. U. Lloyd, E. Norwood, Ohio.
Jas. H. Hyndman, 98 W. 9th St., Cincinnati, O.
Wm. N. Mumper, Hughes High School, Cincinnati, O.
H. T. Nichols, Avondale, Cincinnati, O.
Prof. T. H. Norton, Univ. of Cincinnati, Cincinnati, O.
Prof. L. M. Norton, Mass. Inst. of Technology, Boston.
W. Simonson, 9th and Race Sts., Cincinnati, O.
Dr. Sigmond Waldbott, 150 E. 5th St., Cincinnati, O.
E. C. Wallace, 62 Loth St., Cincinnati, O.
B. D. Westenfelder, Am. Oak Leather Co., Cincinnati, O.
Prof. Chancy R. Stuntz, Woodward High School, Cincinnati, O.
Earnest Twitchell, 559 W. 7th St., Cincinnati, O.

The following members were then elected :

Frank H. Andrews, Providence, R. I.
Lyman C. Newell, Providence, R. I.
Clarence E. Wilson, Providence, R. I.

The following papers were read :

On the Decomposition of Sodium Nitrate by Sulphuric Acid and the Distillation of Nitric Acid by C. W. Volney, Ph. D.

Historical notice. Early mention of Areometers. By A. Bourgougnon.

The meeting was then adjourned.

DURAND WOODMAN,
Recording Secretary.

ON THE DECOMPOSITION OF SODIUM NITRATE BY SULPHURIC ACID AND THE DISTILLATION OF NITRIC ACID.

By Dr. C. W. Volney.

When distilling nitric acid from the usual mixture of sodium nitrate and sulphuric acid, it is frequently observed that at certain periods a violent reaction sets in, and that the contents of the retort are carried over in the receivers. The general supposition is that its cause is overheating, and to prevent it, the distillation is carried on at a low temperature, and the retorts are made of such capacity that the foaming may spend itself without reaching the conducting tube and running over.

However, it can be observed that the foaming of the retort contents occurs at certain periods of the continuation of the process, even when only a very moderate heat is applied, and is therefore dependent not merely upon its external application; and as it does appear that the distilling acid has a close connection with the reaction taking place in the retort, in relation to boiling point and constitution, a consideration of the qualities of nitric acid of different concentrations will serve in the explanation of these different reactions, especially during the distillation of the acid from the mixture of sodium nitrate and sulphuric acid.

A. Smith [1] found that a nitric acid of the constant boiling point 81,56°C had a specific gravity of 1.503—1.51, and was the first hydrate, NO_5HO or HNO_3; also that an acid, boiling constantly at 121°, had the specific gravity 1.41 and was the second hydrate, $NO_5 2HO$ or $N_2O_5 2H_2O$.

Roscoe [2] states, that by boiling nitric acid of any concentration, a residue of constant specific gravity 1.41 and boiling point 120.5° remains; this seems to correspond with Smith's second hydrate.

The existence of definite hydrates of nitric acid has been questioned frequently, but the corresponding boiling points and specific

[1] A. Smith, *Phil. Magazine* (3) 31, p. 454.

[2] Roscoe, *Jahresbericht* 1860, p. 65.

gravities, as well as some reactions in the decomposition of nitrates in presence of water, and the fact that not only anhydrous nitric acid, but also the hydrates, when brought in contact with water, develop heat, cannot very well be explained except upon the theory that several chemical combinations with water exist. Discrepancies in boiling points as well as in specific gravities are always likely to exist, also, the first and second hydrate are constantly decomposing, especially under the influence of light, and this cannot therefore be held as a valid objection to the theory of distinct hydrates. In the preparation and manufacture of nitric acid, the processes and reactions can best be explained by the acceptance of the several hydrates of nitric acid, and the following table of observations furnishes a direct proof of it.

I concluded to conduct the experiments with, comparatively speaking, large quantities, and as I had facilities for obtaining strong acid for the preparation of nitro-compounds and organic nitrates, I had occasion to repeat my observations. The table thereof, which I give here, refers to the distillation of the acid from a mixture of 2500grms. sodium nitrate and 2600grms. of commercial sulphuric acid of 1.837 specific gravity at 67° F. The tubulated glass retort had a capacity of about two gallons, was provided with a thermometer in the tubulus and heated in a paraffine bath the temperature of which could also be ascertained by thermometer. The bulb of the inside thermometer did not reach the mixture in the retort and indicated the temperature of the distilling vapors. The condensation was effected by a Liebig's condenser, whereby an exchange of receivers was rendered easy.

I noted, during the distillation, the time, the temperature, as indicated by the in- and outside thermometer, and the quantities of acid received in different periods; the reactions of the contents of the retort were also observed. These notes are contained in the following:

Time.	Temperature— Outside.	Inside.	Remarks.
A. M. 10.10	83°	45°	Reaction commences.
11.30	85°	47°	Gas forming; mass caking.
11.45	90°	50°	" "
	94°	52°	" "

Time.	Temperature—Outside.	Temperature—Inside.	Remarks.
A. M. 11.45	97°	55°	Gas forming, mass caking.
	102°	58°	" "
11.53	106°	65°	Red vapors appear.
	110°	70°	The red vapors lessen.
	118°	75°	Disappear; white fumes.
	120°	77°	Salt in retort melts; acid vapors distil over.
Noon. 12.00	122°	80°	Mass is foaming; nitrate dissolves rapidly; nitric acid distils well.
P. M. 12.10	122°	81°	Contents of retort are foaming strongly; acid distils rapidly.
12.15	122°	81°	Foaming; contents have risen two inches.
12.16	122°	81°	Foaming; contents have risen two inches.
12.16	122°	81°	The fire lessened to prevent running over.
12.20	120°	80°	Acid distils rapidly and quietly.
	118°	80°	Danger of running over is past.
	115°	81°	Distils well and quietly; I increase fire.
12.30	117°	88°	Distils well; foaming commences again.
12.47	118°	88°	Distils well; foaming commences again.
1.00	120°	90°	Distilling and foaming.
1.10	122°	90°	Distils more slowly; foaming increases.
1.37	125°	90°	Distils less, but foams strongly.
1.45	130°	90°	I increase the fire.
2.00	130°	90°	Foaming; keep up a brisk fire and change the receivers.
2.10	131°	90°	Foaming; commences to distil again.
2.20	131°	90°	Distillation ceases; foaming.
2.45	130°	94°	" " "

Time.	Temperature—Outside.	Temperature—Inside.	Remarks.
P. M. 2.50	130°	97°	No distillation.
3.00	135°	100°	
3.10	138°	100°	Commences to distil.
3.20	138°	100°	" "
3.25	138°	101°	Increase firing.
3.30	138°	101°	Little distillation.
3.36	139°	103°	Distilling.
	141°	104°	"
3.40	142°	105°	"
3.45	142°	105°	Liquid in retort is boiling and foaming
	143°	106°	and distilling.
	144°	108°	Distils slowly; the condenser is cooling; increase the fire.
3.53	144°	108½°	It distils again.
4.05	146°	107°	Keep up fire well.
4.15	146°	108°	Foaming and distilling well.
	146°	109°	Liquid is boiling and distilling well.
	147°	109°	It lessens and red vapors appear.
4.20	148°	109°	Distillation lessens; increase the fire again.
4.25	150°	110°	Distillation ceases entirely; condensing tube cools down; change receivers and increase the fire still more.
4.30	151°	110°	No distillation.
4.35	153°	112°	No distillation; foaming a little.
4.40	155°	113°	" "
4.50	160°	115°	Liquid in retort shows signs of boiling.
5.00	163°	117°	Foaming and distilling a little.
5.10	163°	118°	" " "
5.15	164°	119°	Liquid boils and distils.
5.20	165°	119°	" " "
5.25	164°	120°	Distils well.

Time.	Temperature—Outside.	Temperature—Inside.	Remarks.
P. M. 5.30	165°	121°	Distils well.
5.35	166°	122°	" " Red vapors appear; distillation lessens; increase fire.
5.45	166°	121°	Little distillation; red vapors lessen; condensing tube cools.
5.55	167°	122°	No distillation; tube cools; extinguish fire.

It will be seen that as the periods of this distillation changed, I changed the receivers, and thus obtained three different products, which were weighed and examined.

The first fraction received between 77°–90°, 960g. of 1.5193 sp. gr. at 60° F., almost white. The second fraction, 565grms. of 1.505 sp. gr. and received between 94° and 109°, was nearly white and but slightly yellow. The third portion, which had distilled between 117° and 122°, was light yellow, weighed 316grms., and had a sp. gr. of 1.42.

The first two portions mixed gave 1525grms. of 1.510 sp. gr., which corresponds with the first hydrate usually produced. I have not succeeded in obtaining an acid of over 1.52, and even this had always more or less NO_2 absorbed. I considered this product, therefore, as the yield of first hydrate. As shown in the foregoing notes, this whole product is received between 84° and 109°; it marks at the latter temperature the point where the greatest portion of the acid of the lower boiling point has distilled at the moment of being set free by the decomposition of the nitrate in the retort. This acid should all have gone over at 84°, but below the 109° there are always portions of the sodium nitrate still left undecomposed, and whenever such portions are becoming heated to the point of dissociation they dissolve in the contents of the retort, the foaming spoken of appears and a portion of first hydrate sets in, whereas acid containing more water and of a higher boiling point remains in the retort and only small portions of which of it are carried over with the vapors of the first hydrate. This may explain the occurrence of the second fraction, which ceased to

go over at 109°. At this temperature, all sodium nitrate in the retort is decomposed and the retort contents now consist only of sodium bisulphate and trisulphate and nitric acid of the second hydrate, or of acid which boils at 120°–121° and can be distilled over at this temperature. After this, there is still left always a little nitric acid in the retort, which can be distilled only at a higher temperature and is thereby very considerably decomposed. The acids which may now be obtained contain a weaker nitric acid which has absorbed sometimes considerable dioxyde, coloring it red and giving it a high specific gravity.

From the foregoing observations, I conclude that sodium nitrate is not fully decomposed by sulphuric acid at a low temperature, but only under application of heat; that the first hydrate distils always shortly after being set free, and that the temperature of the mixture remains stationary as long as only this acid is formed. Whenever the decomposing temperature of the nitrate is reached, the first hydrate is suddenly liberated and thereby causes the foaming in the retort. At the same time the nitric acid which, in the retort, has occasion to form the second hydrate, remains until the sodium nitrate is entirely decomposed, from which period on a second hydrate and weaker acid of a higher boiling point distils, there being now in the retort only the different sulphates of sodium and nitric acid.

The foregoing also tends to explain why it takes so long to effect the apparently simple decomposition and distillation and why a strong fire is useless and even injurious to quality and yield of acid. A strong fire will invariably overheat the retort and decompose large quantities of nitric acid, especially the first hydrate. On the other hand, the nitrates could not be decomposed by mixing with sulphuric acid nor the first hydrate be produced therefrom by a simple distillation, because at the temperature at which the nitrate is decomposed the first hydrate boils and thus keeps the temperature of the retort nearly stationary until it is distilled off and the acids of a higher boiling point appear.

HISTORICAL NOTICE.

Early Mention of Areometers.

Compiled by A. Bourgougnon.

Towards the end of the fourth and the beginning of the fifth centuries of the Christian era a celebrated woman, Hypatia, born in the year 370, taught the doctrines of Neoplatonism in the school of Alexandria. She died in 415, massacred by the fanatic followers of St. Cyrille.

To Hypatia the invention of areometers has been attributed. As her writings were destroyed with the burning of the library of Alexandria, this assumption is based upon a letter which she wrote to one of her pupils, Synesius, a Greek writer, who afterwards became bishop of Ptolemais, in 410, and died in 431.

The letter of Hypatia has been translated by F. Hoefer, and is found in his *Histoire de la Physique et de la Chimie, Paris, 1872.* It reads as follows :

"I am so ill that I need an hydroscope. I wish that you would "have one made in copper for me. It is a pipe of a cylin- "drical form, having the shape and the length of a whistle. On "its length it carries a straight line cut across by several small divis- "ions by which we can tell the weight of the waters. At the end is "a cone having the same base as the cylinder. This instrument is "called *Baryllion.* When placed in water by the pointed end it "stands perpendicularly; the divisions cutting the longitudinal "line can be counted, and therefore the density of the water "be known." *

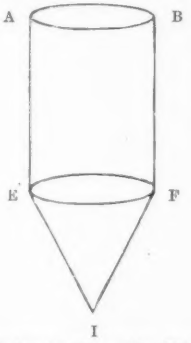
None of the commentators of the letters of Synesius could give an explanation of this instrument.

Benoit Castelli (born at Brescia in 1577, died at Rome, 1644) consulted the celebrated Fermat on this subject.

* Synesius. Epist: XV.

The following is the explanation of the great mathematician, as reported by Castelli in his *Traité de la Mesure des eaux Courantes*,† and found also in Fermat, *Opera Varia:*‡

"This instrument recorded the density of waters to be used by "sick persons, the physicians having observed that the lighter "were the best; the expression ροπη (weight) employed by Sy- "nesius shows it clearly. This word does not mean here *libra-* "*mentum*, as was thought by P. Petau, but weight or density, "called by the Latins *momentum*. As the balance could not give "exactly the difference of weight or the density of waters, the "mathematicians invented, according to the principle of Archi- "medes (*De his quæ vehuntur in aqua*), the instrument described "in the letter of Hypatia. The following is its figure :



A F is a copper cylinder. A B the upper part, always open. E F, the lower part, closed by the cone E I F, having the same base as the cylinder. A E and B F are two straight lines cut by several small divisions. If the instrument is placed in water, point down, and adjusted so as to stand in an erect position, it will sink to a certain point, which will be marked by one of the transverse lines, and it will sink differently in different waters, as will be easy to demonstrate."

Prior to Hypatia, Rhemnius Palemon, a Roman grammarian, contemporary of Tiberius, had given in his poem, *De ponderibus et mensuris*, a very detailed description of areometers and the rules to be followed in their construction.

This author attributed their invention to Archimedes.

The description of Palemon is as follows :‖

"Ducitur argento, tenuive ex aere cylindrus,
"Quantum inter nodos fragilis producit arundo.

† Rome, 1628.
‡ Toulouse, 1679.
‖ Leyden, 1587.

"Cui cono interius modico pars ima gravatur,
"Ne totus sedeat, totuisve supernatet undis
". . . . Hoc cujusque potes pondus spectare liquoris
"Nam si tenuit erit, majori immergatur unda ;
"Sin gravior, plures modulos super esse notabis," etc.

And reads thus :

A very thin cylinder of silver or copper is made, having its length equal to the distance separating the knots of a frail reed ; its lower part is so loaded with a small, cone-shaped weight as to prevent it from sinking entirely or floating horizontally. With this instrument the weight of a liquid can be known; if it is light, a large part of the cylinder is immersed; if it is heavy, a greater number of divisions are observed above the liquid.

The physicists of the Eighteenth Century, Fahrenheit, Nicholson, Baumé, must have employed these directions to construct their areometers, although they did not give their origin.

Abstracts of American Patents Relating to Chemistry.

(*From the U. S. Patent Office Gazette.*)

(*Issued October 6th, 1891.*)

460,570.—Manufacture of photographic film. Benjamin J. Edwards, London, Eng.

460,595.—Arc lamp pencil. Isaiah L. Roberts, Brooklyn, N. Y.

A pencil for arc lamps, composed of a metal associated with a substance containing chromium, or a metal tube filled with chromate of iron and hydrate of sodium.

460,621.—Process of giving a matte surface to albuminized silver-paper photographs. James D. Wriggleworth and Frederick C. Binns, Wellington, New Zealand.

460,629.—Apparatus for making artificial silk. Hillaire de Chardonnet, Besancon, France.

460,683.—Apparatus for testing mine gases. Thomas Shaw, Philadelphia, Pa.

460,685.—Apparatus for coating plates with tin. Henry F. Taylor and William B. Struse, Briton Ferry, Eng.

460,697.—Hydraulic lime. John H. Wright, Louisville, Ky.

Crude potash, crude soda ash, alum, sulphate of lime and water are combined with unslaked lime.

460,722.—Apparatus for washing and separating gold and silver from their ores. William J. Tanner, London, Eng.

460,732.—Ore separator. Horace H. Taylor, Fresno, Cal.

460,733.—Ore feeder. James Tulloch, Angel's Camp, Cal.

460,814.—Concentrator. Gustav Lang, San Francisco, Cal.

460,842.—Composition of matter for soles of shoes. George E. Brown and John W. Blackwell, Wrentham, Mass.

A composition of rubber, litharge, whiting, flour of sulphur, lamp black, and a gritty substance.

460,861.—Preserving compound. James M. Gillihan and Thomas J. Gillihan, Olathe, Kans.

Nitrate of potassium, sulphur and salicin are the preservatives used.

460,985.—Process of making sodium or potassium. Curt Netto, Dresden, Saxony, Germany.

Process for the production of potassium or sodium from their hydroxides in a continuous operation, which consists in bringing the caustic alkali into contact with the reducing carboniferous matter at such a low temperature that only the caustic alkali is reduced to a metallic state, while the alkali carbonate simultaneously formed remains undecomposed

and is withdrawn out of the reach of the reducing carboniferous matter without interruption of the reducing process or the admission of air to the reducing vessel or retort during the reducing operation.

460,989.—Process of preparing wort. Carl Rach, Chicago, Ill.

A mash of malt is first made and separated into thin liquid and a thick mash; second, the thick mash is cooked at the boiling point; third, making a mash of natural cereals mixed with a small per cent. of malt and stirred and cooked under pressure; fourth, mixing, cooling and stirring the two thick mashes above referred to; fifth, cooling this mixture and the thin liquid above referred to to about 158° F., and mixing half of the thin liquid with the mash; sixth, letting the mash stand until the erythrodextrine reaction has ceased; seventh, raising the temperature of the remaining thin liquid to boiling point and then mixing it with the mash so as to raise the temperature of the whole to 176° to 178° F.; eighth, drawing off the wort in the ordinary way.

461,010.—Process of removing lime from hides. Charles W. Cooper, Brooklyn, N. Y.

The said materials are subjected in a bath of water to carbonic acid gas.

461,024.—Composition for electric batteries. Daniel M. Lamb, Boston, Mass.

461,026.—Compound for electric batteries and method of preparing the the same. D. M. Lamb, Boston, Mass.

461,034.—Process of making quick malt. Martin L. Mowrer, Dayton, O.

Malt is soaked in water of a temperature of 100 to 150° F. for a period of about six hours, then slowly drained for about the same length of time, then crushed and dried.

461,050.—Crushing machine. Wilhelm Schranz, Laurenburg, Germany.

461,086.—Blue azo dye. Gustav Schulz, Berlin, Germany.

Hexa azo dyes derived from one molecule of toluidine or anisidine, one molecule of alpha-naphthylamine, and two molecules of an alpha-naphthol disulpho acid. The dyes are insoluble in alcohol, readily soluble in water and sulphuric acid, and are not readily affected by air and light.

461,108.—Process of tanning. Robert W. Turner, Dublin, Tex.

The hides are subjected first to a weak solution and then to a strong solution of an infusion of the plant *Amphiachyris Draconculoides.*

461,164.—Process of making fertilizer from stick. Joseph Van Ruymbeke, Chicago, Ill.

The stick is first treated with sulphates in the usual way, then dissolved in sulphuric acid, and then mixing therewith tribasic phosphate of lime and allowing the mass to lie until apparently dry.

461,235.—Device for feeding chemicals to filters. Thomas H. Butler, Baltimore, Md.

461,251.—Art or method of galvanizing metal. Henry K. Swinscoe, Clinton, Mass.

461,260.—Hemp or flax decorticating machine. Augustus E. Ellinwood, Akron, O.

461,343.—Method of and apparatus for producing from coal smokeless flame for heating. William A. Koneman, Chicago, Ill.

461,365.—Process of preserving timber. James McKeon, Oakland, Cal.

461,372.—Jelly extractor. Rose Smith, Grand Rapids, Mich.

461,394.—Process of and apparatus for manufacturing gas. James M. Rose, Alleghany, Pa.

(Issued October 20th, 1891.)

461,416.—Process of obtaining alumina from bauxite. Joseph A. Bradburn and John D. Pennock, Syracuse, N. Y.

The process consists in oxidizing the iron and organic matter by treatment with a hypochlorite and carbonic acid gas, then treating the oxidized bauxite with caustic soda solution, filtering out the liquor, precipitating the hydrate of aluminum, and calcining it.

416,425.—Ore concentrator. Frederick M. Endlich, Ouray, Col.

416,429.—Mining sulphur. Herman Frasch, Cleveland, Ohio.

The process consists in liquefying the sulphur in the mine by fusion and removing the melted sulphur.

461,430.—Apparatus for mining sulphur. Herman Frasch, Cleveland, Ohio.

461,431.—Mining sulphur. Herman Frasch, Cleveland, Ohio.

A sulphur solvent is used to remove the sulphur from the underground deposit.

461,467.—Composition of matter for insulating purposes. Marcus O. Farrar and Charles C. Howe, Bristol, N. H.

461,513.—Lubricant. Adolph Sommer, Berkeley, Cal.

A fluid or unctuous lubricant, consisting of a mineral lubricating substance and compounds of chloride of sulphur with fats or fatty oils.

461,542.—Process of making concrete tombstones. Neill C. Cameron, Magnolia, Ark.

461,550.—Drying, dessicating and roasting apparatus. Carl Salomon, Brunswick, Germany.

461,664.—Construction of apparatus for softening and purifying water. Richard S. Brownlow, Manchester, Eng.

461,665.—Process of producing hydrofluosilicic acid. Thomas W. Cappon, Brooklyn, N. Y.

Fluoride of silicon is passed into an aqueous solution containing hydrofluoric acid.

461,675.—Process of and apparatus for refining cotton seed oil. William A. Grant, Houston, Tex.

461,681.—Process of purifying bromine. Jacob C. Kautz, Mason, W. Va.

The bromine is passed in a gaseous form, before condensing, through a solution of the bromide.

461,684.—Process of mashing. Leopold Mandl, Buda-Pesth, Austria-Hungary.

The raw material is introduced into a body of water, heated to not over 100° C., heat is then discontinued, and the mash subjected to air under high pressure for a desired time.

461,692.
461,693. } Concentrators. Bryon Tyson, Washington, D. C.

461,774.—Process of making yeast. Akos Von Sigmund and Rudolf Genge, Klausenburg, Austria-Hungary.

The yeast is manufactured from starch-containing substances by "treating the raw material with acid, holding the matter under steam pressure until the formation of dextrose is completed, then neutralizing the excess of acid in the mash, adding a second protein-containing mash produced by steaming raw material mixed with acidulated water until it is saccharified, mixing this second mash with the first mash, filtering the entire mash to obtain a clear wort, fermenting the clear wort by an addition of yeast while simultaneously passing clarified or ozonzed air through the wort, and finally separating the yeast from the fermented wort."

461,783.—Coffee roaster. Adolphus D. Goodwin, Salem, Va.

461,789.—Crushing and grinding mill. James W. Winchell, Springfield, Ohio.

(Issued October 27th, 1891.)

461,823.—Secondary battery electrode. Justus B. Entz, New York, William A. Phillips, Brooklyn, N. Y.

461,858.—Secondary battery. Montgomery Waddell and Justus B. Entz, New York, N. Y.

461,888.—Process of manufacturing artificial stone, etc. George Richardson, Washington, D. C.

461,889.—Machine for solidifying concrete mixtures. George Richardson, Washington, D. C.

461,890.—Concrete block and method of making the same. George Richardson, Washington, D. C.

461,893.—Ore concentrator. Charles E. Seymour, Hurley, Va.

461,965.—Galvanic battery. Calvin N. Southern, Chicago, Ill.

461,973.—Process of manufacturing compressed cakes of soap. Edward G. Brown, Brooklyn, N. Y.

461,980.—Manufacture of enameled brick. Wenzel A. Miksch, Philipsburg, Pa.

A coating of enamel is applied to a green brick, then exposed to a temperature sufficient to simultaneously burn the brick and fuse the enamel, and after cooling the brick, coating its surface with a fusible

colored glazing compound of low melting-point and reheating the brick to melt the glaze.

461,982.—Apparatus for manufacturing gas. Trent T. Prosser and Chas. H. Wilder, Boston, Mass.

462,021.—Gas retort furnace. William H. Snow, Holyoke, Mass.

462,035.—Furnace for burning garbage. Miles L. Davis, Lancaster, Pa.

462,085.—Sulphur candle. Stephen B. Morss, Rahway, N. J.

462,095.—Process of extracting juice from sugar scum. August Hamelberg, San Domingo, San Domingo.

The scum previously obtained from cane juice is distributed over the shredded or partially pressed canes, and then subjected to another pressing operation.

462,103.—Ore crusher. Percy R. Shill, East Dulwich, Eng.

462,118.—Refrigerating apparatus. Jacob Erney, Philadelphia, Pa.

462,120.—Vulcanizer. James Fergus, Philadelphia, Pa.

462,137.—Process of revivifying gas purifying agents. Charles W. Jones, Milan, Italy.

462,161.—Manufacturing of gas. Trent T. Prosser and Chas. H. Wilder, Boston, Mass. J. F. G.